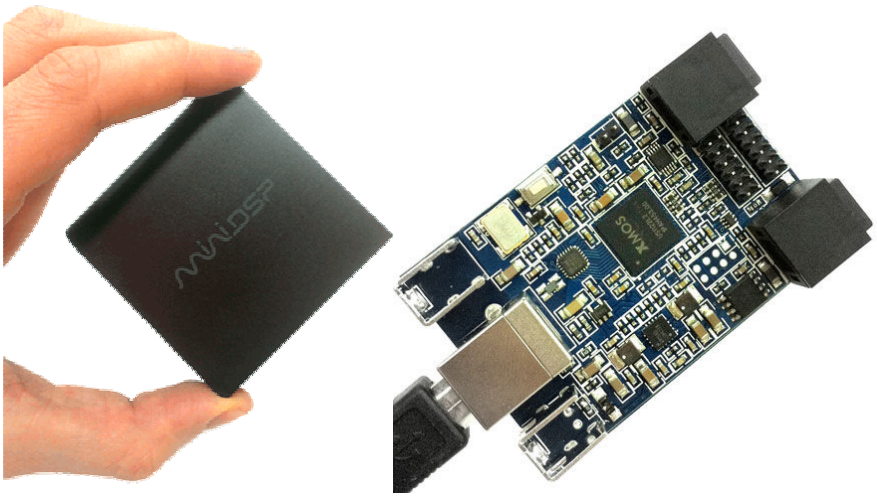
USBStreamer

USER MANUAL

V1.2



Revision	Description	Date
V1.0	User manual – Initial version	20-06-2012
V1.1	Mac OSx configuration	09-08-2012
V1.2	Adding USBStreamer B information + Win8 setup	26-05-2014

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1 Product Introduction

Thanks for your purchase of the USBStreamer product. The following manual summarizes the core technical features of the USBStreamer in order to help the setup and integration in your project.

Package content

Your USBStreamer package includes:

- 1 x USBStreamer B or USBStreamer kit
- 1m long USB cable
- 2 x 1m long optical cables
- Two 2x6pin connectivity cables (kit only)

Disclaimer / Warning

- An incorrect USBStreamer configuration could easily damage your audio system. MiniDSP Ltd can not be held responsible for any damage that may result from the improper use of this kit. As with any other product, we do recommend that you carefully read the manual and other technical notes to insure you fully understand how to operate the board.

- This manual does not intend to cover the wealth of knowledge about I2S and other digital electronic concepts relevant to the USBStreamer kit interface. I2S comes in a wide range of configurations (clock rates /ratio / bit depth…) and you should never assume that I2S is plug&play. Do your homework in making sure signals will be compatible first.

- If you decide to customize our boards, be warned that it is outside of our support structure and could potentially void the warranty of this device.

2 Minimum System Requirements for software installation

USBStreamer is a multi-channel USB audio interface running on both Windows & Mac environments. The following minimum requirements are required to make it operate.

PC environment – Driver required

- PC with 1GHz or higher processor clock speed recommended / Intel® Pentium®/Celeron® family, or AMD K6®/AMD Athlon®/AMD Duron® family, or compatible processor recommended.
- 512 megabytes (MB) of RAM or higher recommended
- USB 2.0 port
- Microsoft• ® Windows® XP SP2/Vista/7/8

Mac environment – No driver required

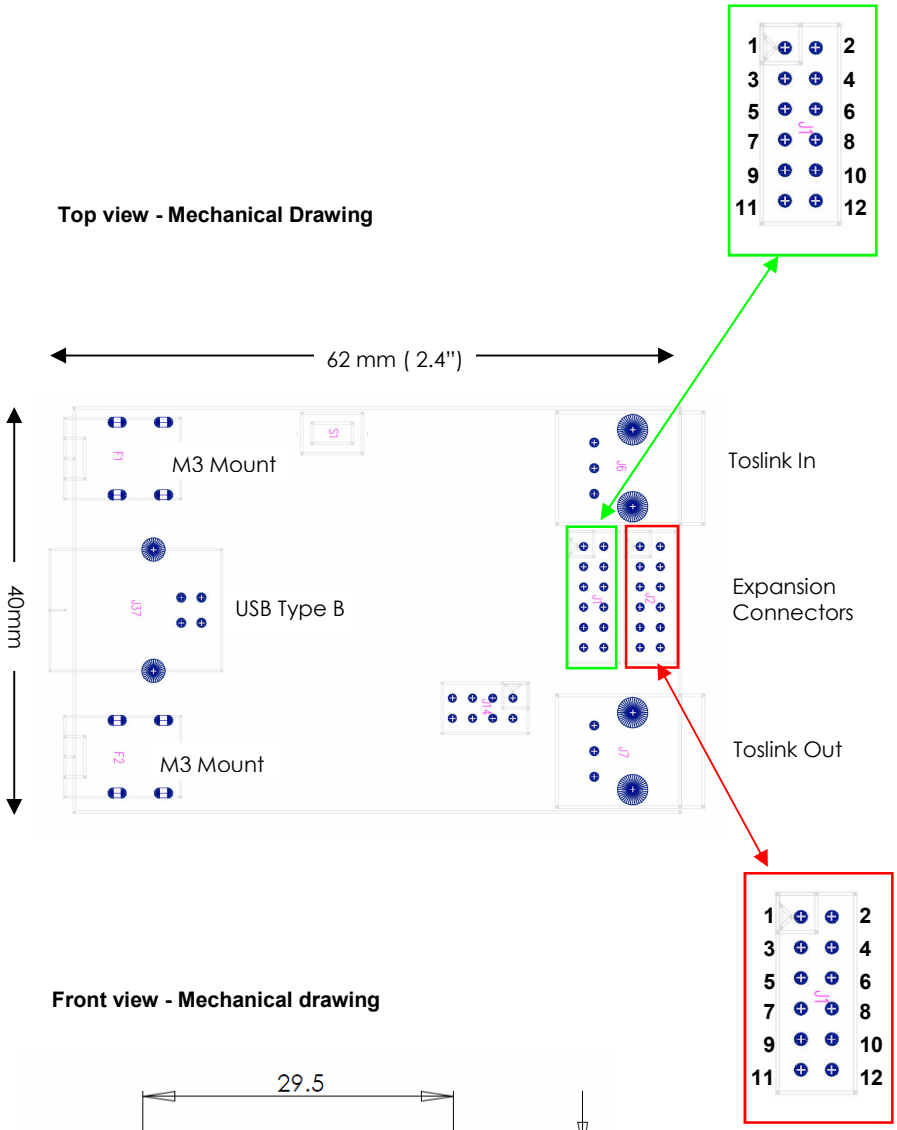
- Power PC/Intel Core Duo
- 256 megabytes (MB) of RAM or higher recommended
- USB 2.0 port

Important note: USBStreamer requires a High Speed USB 2.0 port for streaming native signal at 24/192kHz. USB 1.0 ports will not have enough bandwidth to support so many channels.

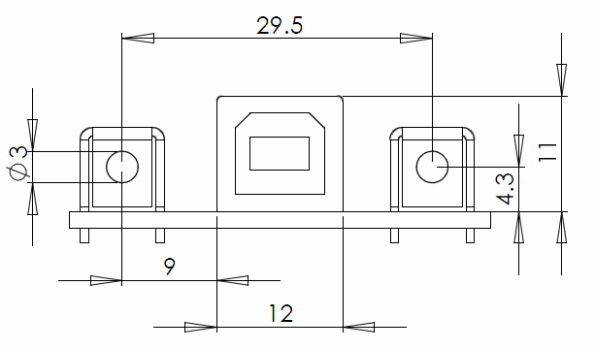
3 Board diagram USBStreamer Kit

4

Top view - Mechanical Drawing



Front view - Mechanical drawing



J1 Expansion connector pin out

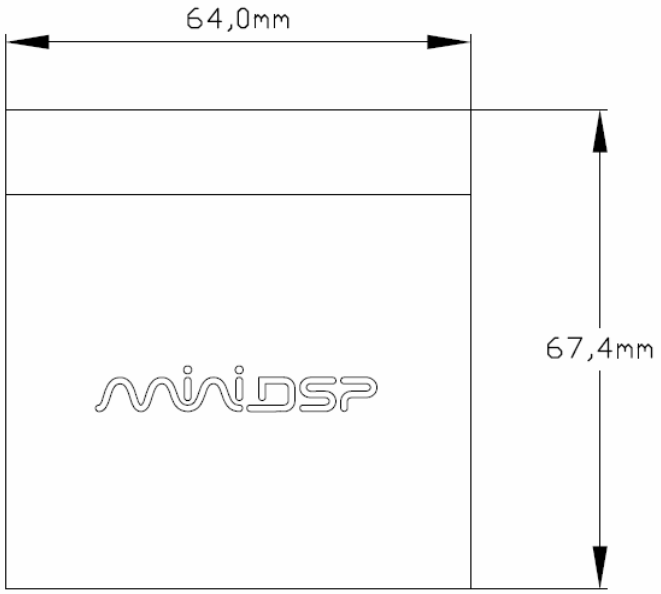
Pin	Description
1	I2S data OUT ch1&2 - Playback
2	I2S data IN ch1&2 - Recording
3	I2S data OUT ch3&4 - Playback
4	I2S data IN ch3&4 - Recording
5	I2S data OUT ch5&6 - Playback
6	I2S data IN ch5&6 - Recording
7	I2S data OUT ch7&8 - Playback
8	I2S data IN ch7&8 - Recording
9	Master Clock out (MCLK OUT)
10	I2S System clock (SCLK)
11	Ground (GND)
12	I2S frame synch (LRCLK)

J2 Expansion connector pin out

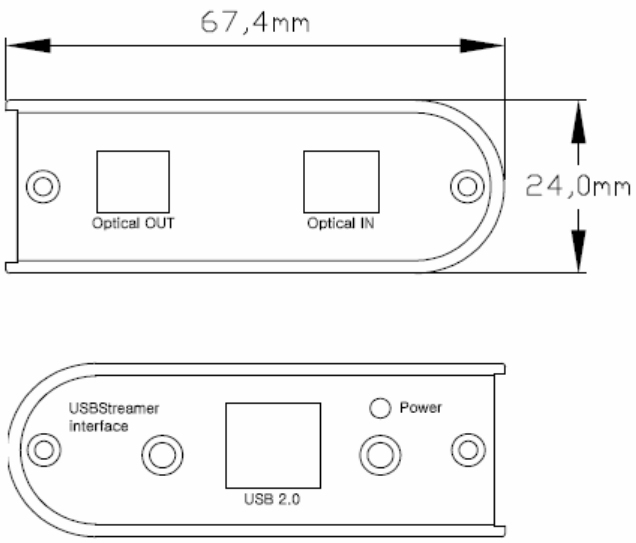
Pin	Description
1	GND
2	NC
3	GND
4	NC
5	NC
6	GPIO (future)
7	GPIO (future)
8	RST (negative low)
9	GPIO (future)
10	GPIO (future)
11	Ground (GND)
12	5V input for external power Recommended 300mA PSU

5 Board diagram USBStreamer Box

TOP VIEW



FRONT/REAR VIEWS



6 Toslink/ADAT connectivity

USBStreamer can simultaneously transmit (audio playback to another device, e.g. DAC) and/or receive (audio recording from another device e.g. ADC). The following I/O are available:

- **TOSLINK protocol**. For stereo streaming, it doesn't require any configuration nor electronic knowledge. Audio Playback and Transmit works Plug & Play up to 192kHz simultaneous playback and recording.

- **ADAT protocol:** for multichannel audio streaming. Up to 8channels can be streamed @ 44.1/48k.

To enable the Toslink mode, you must run the I2S + Toslink firmware.
To enable the ADAT mode, you must run the ADAT firmware.
Both firmware are available from the user downloads section of minidsp.com website. See the firmware upgrade section of this user manual for more information.

7 I2S connectivity to 3rd party devices

I2S stands for Inter-IC Sound protocol and is most commonly used to carry audio information between IC's. This protocol is not intended to run long cables lengths, but only short Inter-IC, board to board connections. Note that the USBStreamer can only operate as an I2S Master (clock being outputs from the device).

Clock lines

- MCLK: Master clock of the device for both playback and recording is a ratio of the sample rate (Fs = LRCLK). This pin is an output only.
- LRCK: The frame synchronization which is equal to the sampling frequency (Fs) of the native signal being streamed To/From the USB port. This pin is an output only
- SCLK: The system clock which is always equal to 64 x Fs. This pin is an output only.

Sample Rate (LRCLK)	Master Clock (MCLK)	System Clock (SCLK)	MCLK/LRCLK	SCLK/LRCLK ratio
44.1 kHz	22.5792 MHz	2.822 MHz	512	64
48 kHz	24.576 MHz	3.072 MHz	512	64
88.2 kHz	22.5792 MHz	5.6448 MHz	256	64
96 kHz	24.576 MHz	6.144 MHz	256	64
176.4 kHz	22.5792 MHz	11.2896 MHz	128	64
192 kHz	24.576 MHz	12.288 MHz	128	64

Data lines

- SDIN: 16/24bit data input to the USBStreamer for audio recording.
- SDOUT: 16/24bit data output from the USBStreamer for audio playback.

The following timing diagram illustrates the expected I2S audio format.

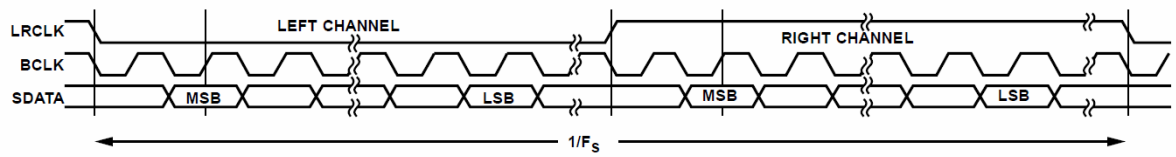


Figure 31. I²S Mode—16 Bits to 24 Bits per Channel

8 Windows Driver installation

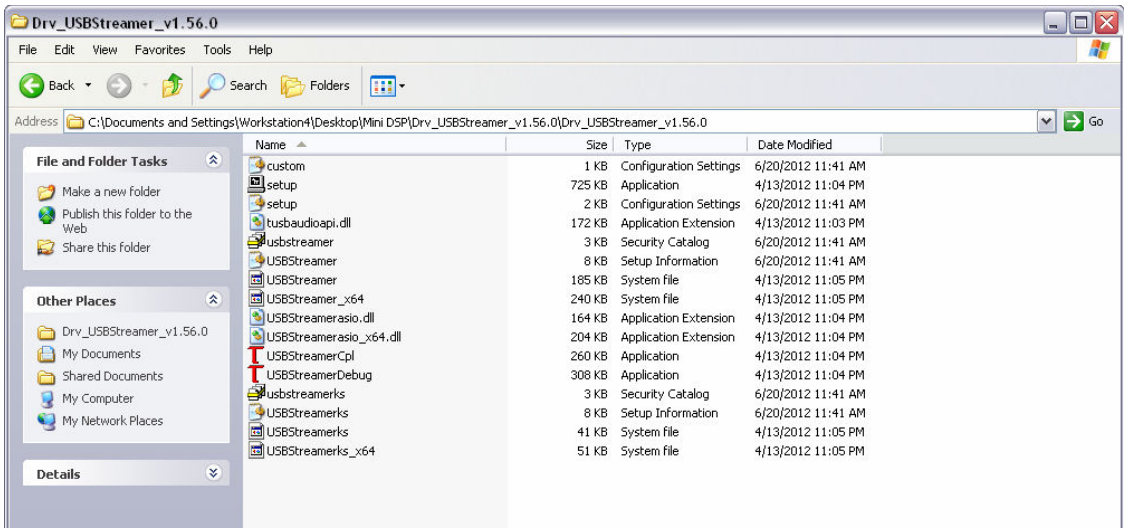
NOTE1 : This section is for Windows OS only. If you have a Mac OSx you can skip to section 7 of this user manual

NOTE2: On win8/8.1, a driver signing requirement will prevent the installation at this stage. Please see the appendix section of this user manual to be able to disable this feature.

The first step is to download the latest version of the USBStreamer driver package. This driver will be made available in the User Download section of the miniDSP website on purchase of the product. Please log-in with the user account credentials used during your purchase and look for the USBStreamer section at the following link:

http://www.minidsp.com/userdownloads

Once the driver downloaded, please unzip the folder on your PC. The following files will be unzipped.


Drv_USBStreamer_v1.56.0
File Edit View Favorites Tools Help
Back Search Folders
Address C:\Documents and Settings\Workstation4\Desktop\Mini DSP\Drv_USBStreamer_v1.56.0\Drv_USBStreamer_v1.56.0
Go
File and Folder Tasks
Make a new folder
Publish this folder to the Web
Share this folder
Other Places
Drv_USBStreamer_v1.56.0
My Documents
Shared Documents
My Computer
My Network Places
Details
Name Size Type Date Modified
custom 1 KB Configuration Settings 6/20/2012 11:41 AM
setup 725 KB Application 4/13/2012 11:04 PM
setup 2 KB Configuration Settings 6/20/2012 11:41 AM
tusbaudioapi.dll 172 KB Application Extension 4/13/2012 11:03 PM
usbstreamer 3 KB Security Catalog 6/20/2012 11:41 AM
USBStreamer 8 KB Setup Information 6/20/2012 11:41 AM
USBStreamer 185 KB System file 4/13/2012 11:05 PM
USBStreamer_x64 240 KB System file 4/13/2012 11:05 PM
USBStreamerasio.dll 164 KB Application Extension 4/13/2012 11:04 PM
USBStreamerasio_x64.dll 204 KB Application Extension 4/13/2012 11:04 PM
USBStreamerCpl 260 KB Application 4/13/2012 11:04 PM
USBStreamerDebug 308 KB Application 4/13/2012 11:04 PM
usbstreamerks 3 KB Security Catalog 6/20/2012 11:41 AM
USBStreamerks 8 KB Setup Information 6/20/2012 11:41 AM
USBStreamerks 41 KB System file 4/13/2012 11:05 PM
USBStreamerks_x64 51 KB System file 4/13/2012 11:05 PM

8.1 Connect your USBStreamer unit

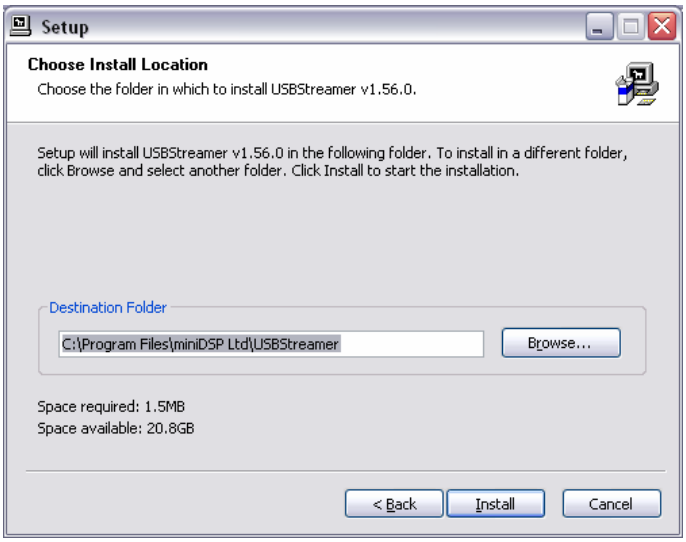
In order to automatically detect the USBStreamer following the driver installation, connect the USBStreamer to your PC before going to the following step.

8.2 Setup the driver package

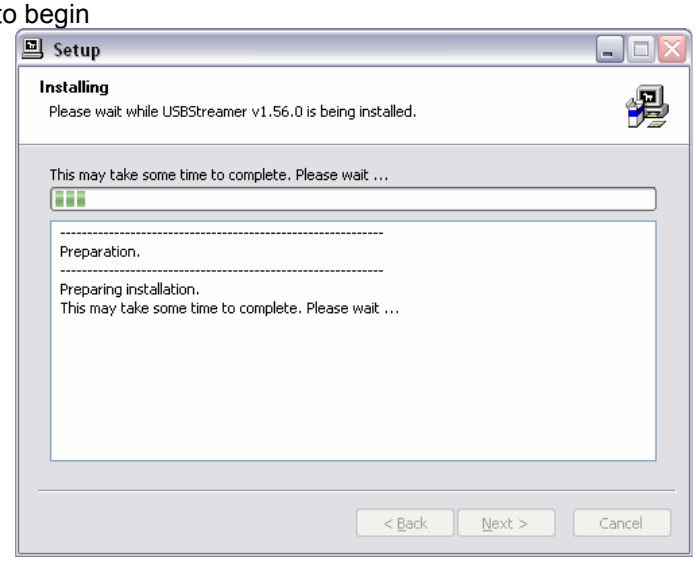
Click on the setup.exe application to start the installation process. After clicking next, the setup wizard will check your system capabilities.

Setup
Welcome to the USBStreamer v1.56.0 Setup Wizard
This wizard will guide you through the installation of USBStreamer v1.56.0.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel

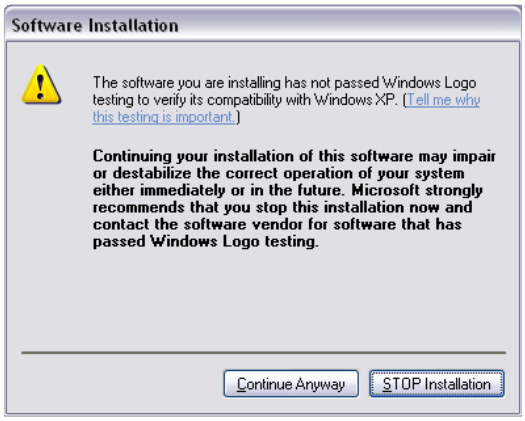
Next step is to choose a location on your harddrive for the installation.


Setup
Choose Install Location
Choose the folder in which to install USBStreamer v1.56.0.
Setup will install USBStreamer v1.56.0 in the following folder. To install in a different folder, click Browse and select another folder. Click Install to start the installation.
Destination Folder
C:\Program Files\miniDSP Ltd\USBStreamer
Browse...
Space required: 1.5MB
Space available: 20.8GB
< Back
Install
Cancel

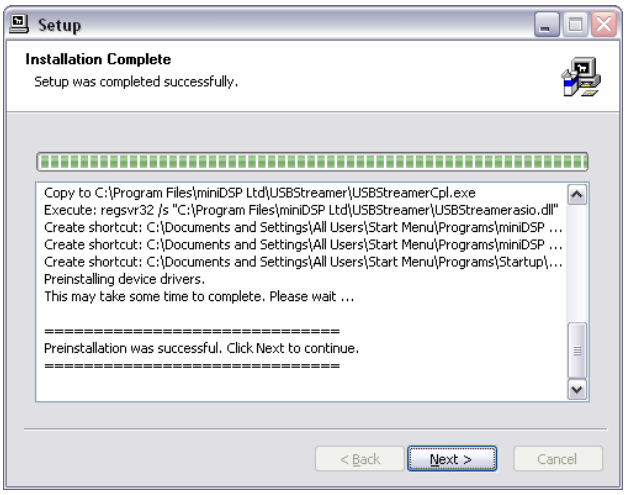
Wait for the installation to begin


Setup
Installing
Please wait while USBStreamer v1.56.0 is being installed.
This may take some time to complete. Please wait ...
Preparation.
Preparing installation.
This may take some time to complete. Please wait ...
< Back
Next >
Cancel

Click on Continue Anyway at the warning about driver certificate.


Software Installation
The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

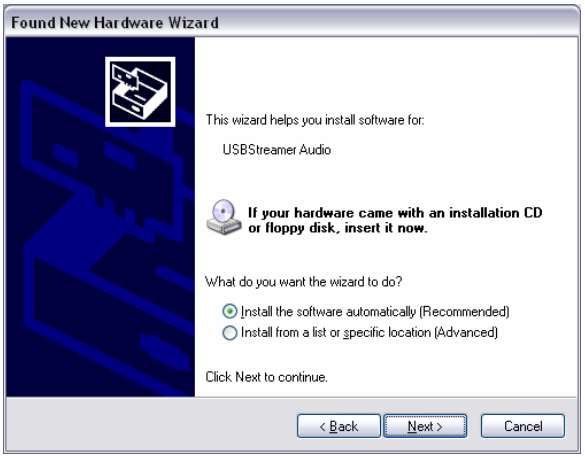
A successful installation will show the following dialog box.

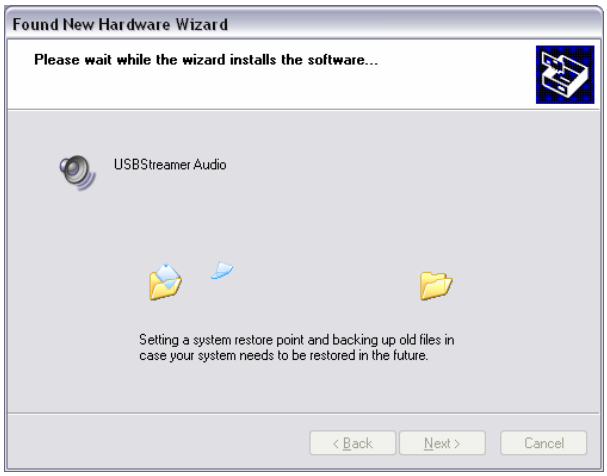

Setup
Installation Complete
Setup was completed successfully.
Copy to C:\Program Files\miniDSP Ltd\USBStreamer\USBStreamerCpl.exe
Execute: regsvr32 /s "C:\Program Files\miniDSP Ltd\USBStreamer\USBStreamerasio.dll"
Create shortcut: C:\Documents and Settings\All Users\Start Menu\Programs\miniDSP ...
Create shortcut: C:\Documents and Settings\All Users\Start Menu\Programs\miniDSP ...
Create shortcut: C:\Documents and Settings\All Users\Start Menu\Programs\Startup\...
Preinstalling device drivers.
This may take some time to complete. Please wait ...
==========
Preinstallation was successful. Click Next to continue.
==========
< Back
Next >
Cancel

Following the pre-installation of the drivers on your PC, the connected USBStreamer will now be detected by Windows (pop up window as follow)

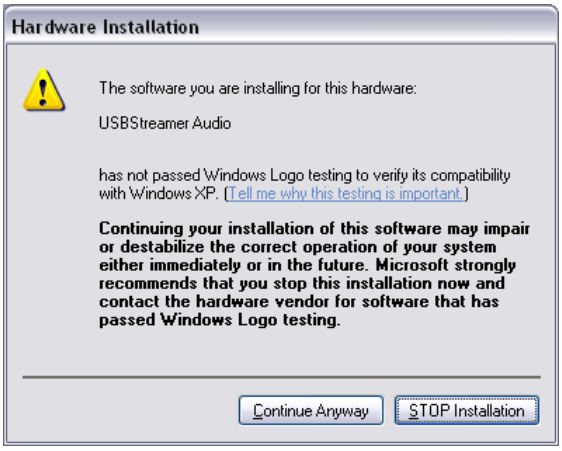
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Click on Install the software automatically.


Found New Hardware Wizard
This wizard helps you install software for:
USBStreamer Audio
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel


Found New Hardware Wizard
Please wait while the wizard installs the software...
USBStreamer Audio
Setting a system restore point and backing up old files in case your system needs to be restored in the future.
< Back
Next >
Cancel

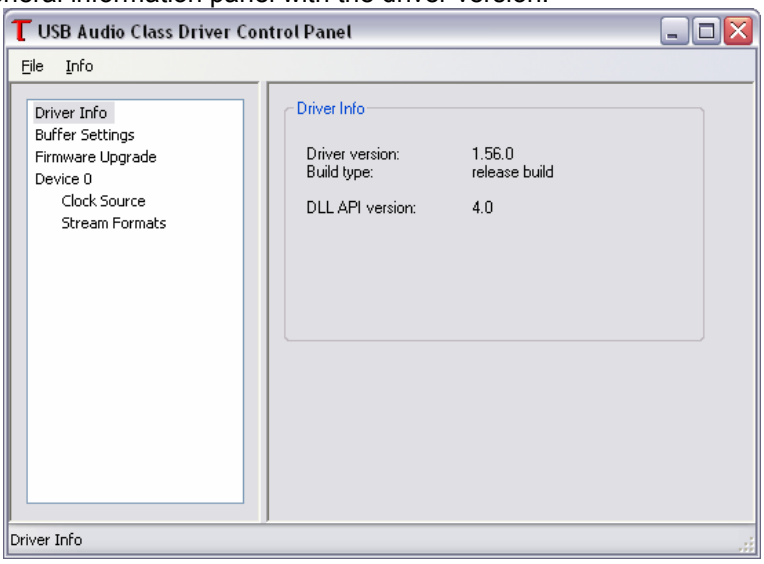
Click on “Continue Anyway” to the warning message about driver signing.


Hardware Installation
The software you are installing for this hardware:
USBStreamer Audio
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

8.3 Windows driver configuration

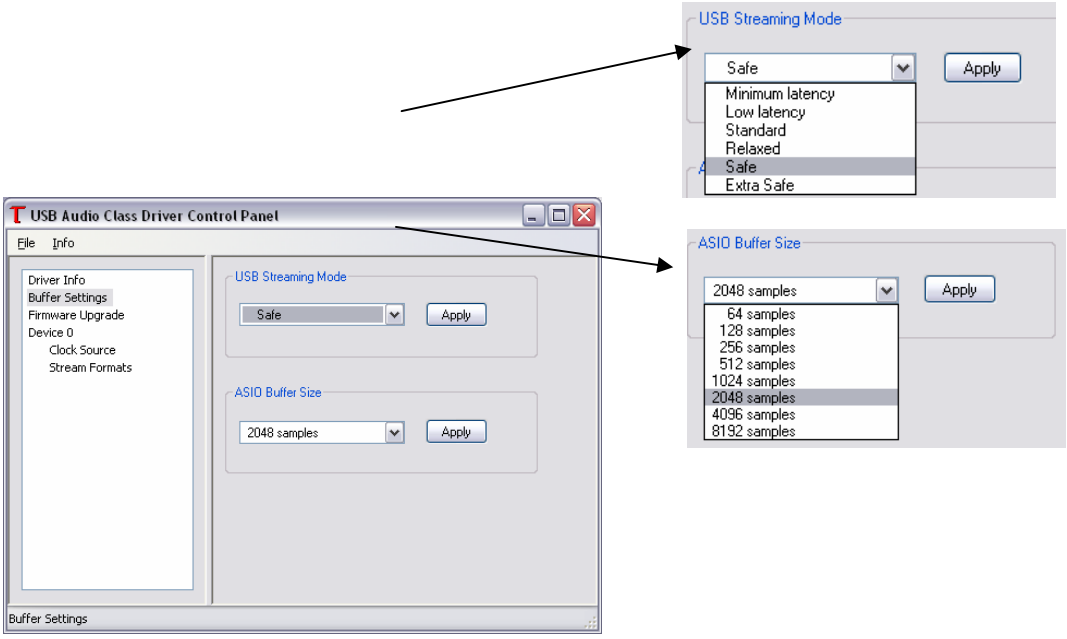
8.3.1 Driver general info

This panel is just a general information panel with the driver version.



8.3.2 Buffer settings

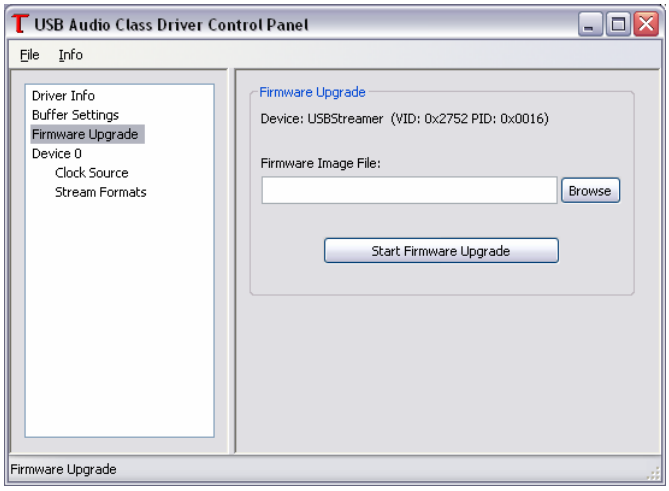
The buffer setting is meant for those looking to optimize the buffering and latency settings of the interface. Note that change of these settings may result in unstable operation since such modifications are PC resource-dependant. In other words your PC + OS configuration may not have the horsepower/memory sufficient to have the lowest latency settings. If you do not require lowest latency (e.g. simple audio playback), we recommend that you do not modify the default safe settings.



8.3.3 Firmware upgrade

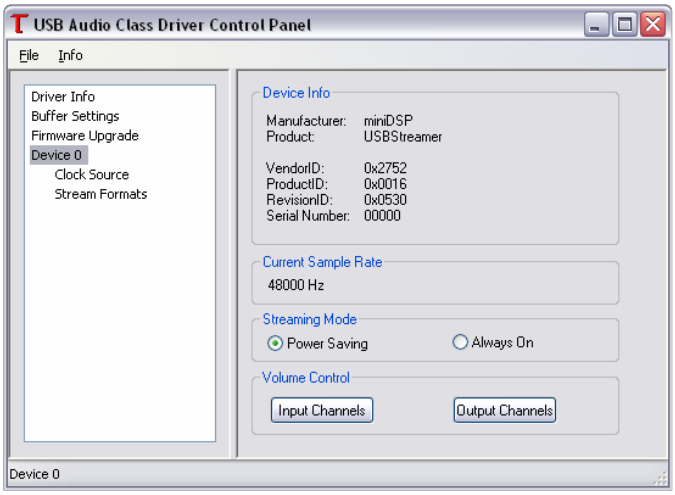
In the event of a newer firmware, newer features added by our engineering team, the USBStreamer can be firmware upgraded. Please consult the USBStreamer User Downloads page for the link of the latest firmware if any is available.

Note that firmware upgrade can only be done from Windows OS.



8.3.4 Device configuration

This panel is the configuration panel for the device currently connected to the PC. Note that while multiple USBStreamers can be connected to a single PC, they can't use the same USBController else the chances of overloading the bandwidth of the controller are to be considered.



The Current sample rate information is a mirror of the file being played by the Windows player (in this case a 1kHz tone file playing at 48kHz). If the audio player was to play back a 192kHz, the current sample rate would change to 192kHz reading. In short, that is not a setting you can change manually. It is the played back file that will define the "Current sample" rate.

8.3.5 Input channel volume control (recording)

This panel is self explanatory but here is some basic information of the control available:

- 1 x Master volume control for all 10 input channels
- 8 x volume controls for all I2S input channels
- 2 x volume controls for the toslink receiver

Note that controls of each channel pair can be linked (stereo case) or unlinked (mono).
The M button is equivalent to the Mute button.

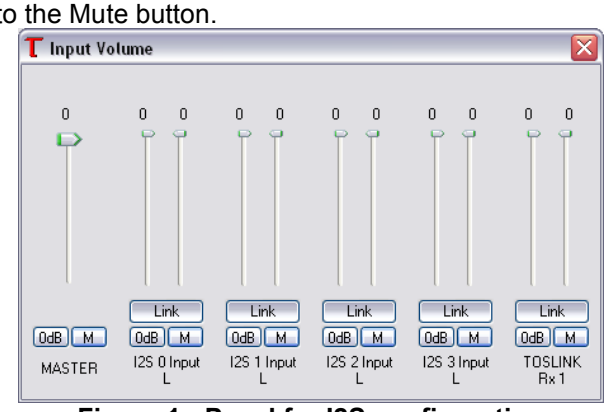


Figure 1 - Panel for I2S configuration

8.3.6 Output channel volume control (playback)

This panel is self explanatory but here is some basic information of the control available:

- 1 x Master volume control for all 10 output channels
- 8 x volume controls for all I2S outputs channels
- 2 x volume controls for the Toslink transmitter

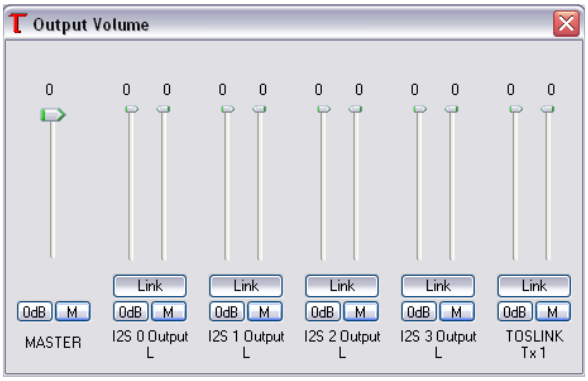
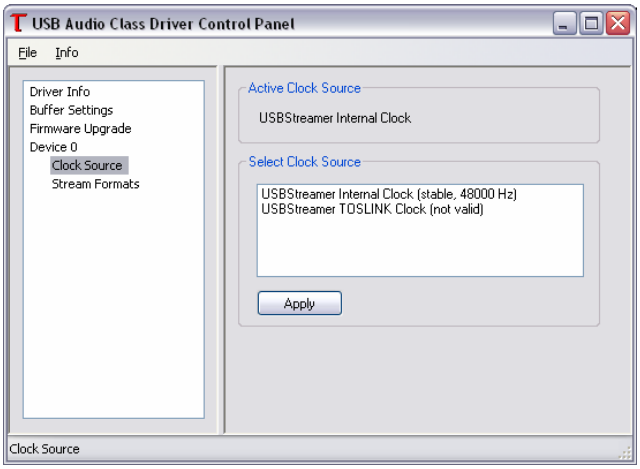


Figure 2 - Panel for I2S configuration

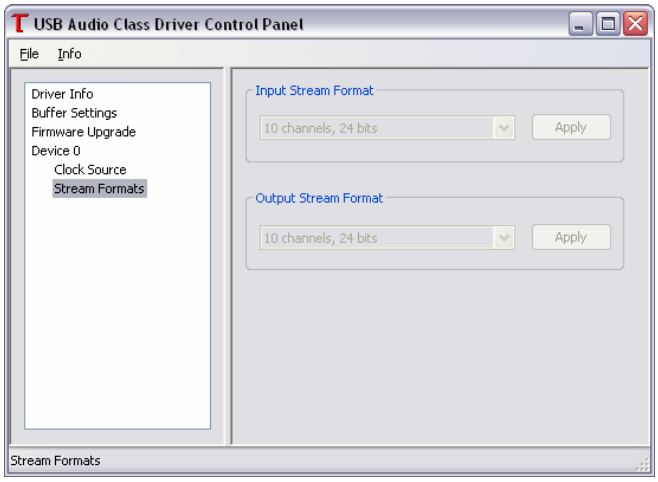
8.3.7 Clock source

This panel allows end user to select an external clock source (E.g. toslink) as a reference clock.



8.3.8 Stream formats

This panel isn't enabled since the configuration of the USBStreamer is always defaulted to 10x IN, 10 x OUT.

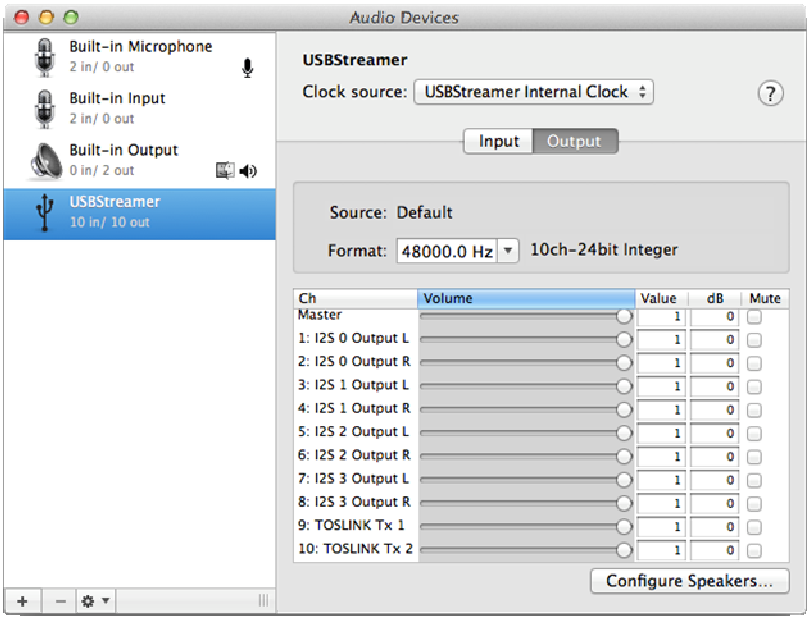


9 Mac OSx configuration

Mac OSx has native support for USB Audio class 2.0 device and therefore doesn't require any drivers. The the device will automatically be detected as a compliant multichannel USB audio interface. See below some screenshot of the interface.

9.1.1 Device configuration

Once plugged, the device will automatically appear in Utilities - > Audio Midi setup. Select the interface to configure the settings such as format/Clock source.

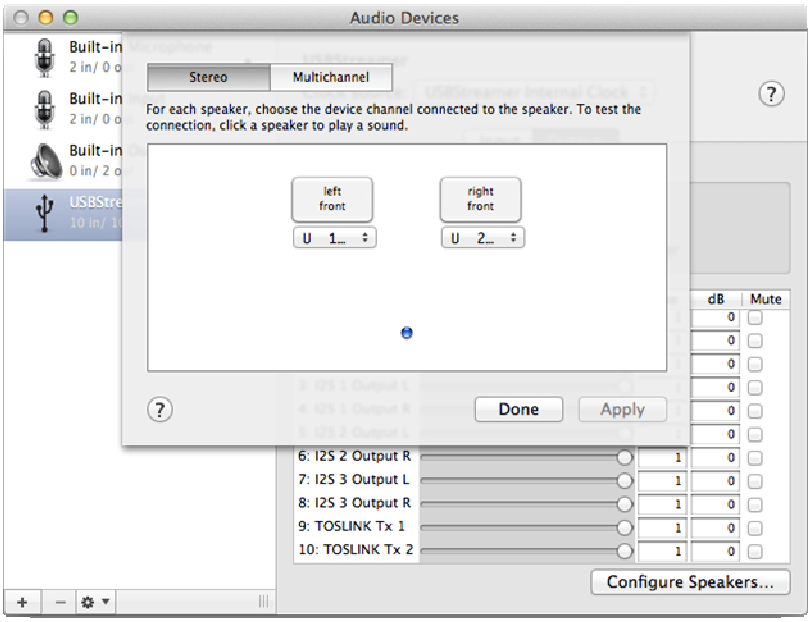


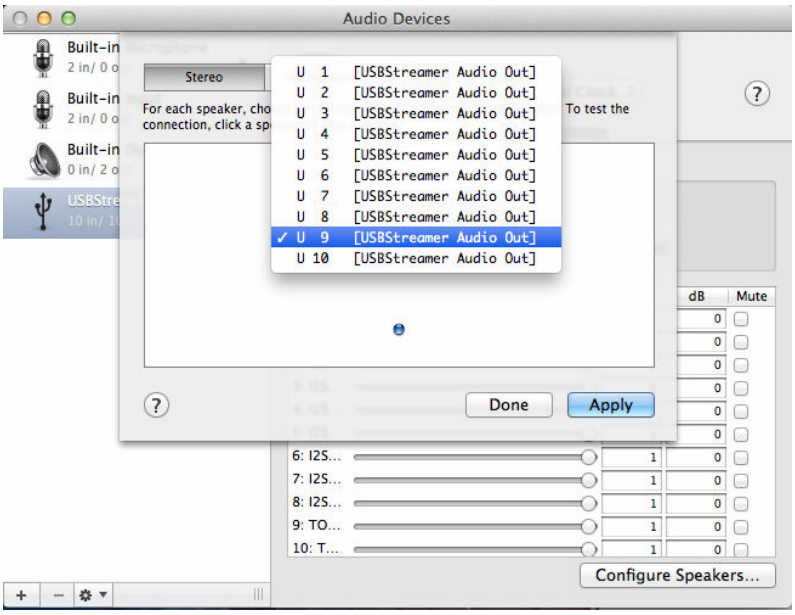
To enable this sound card as a default output device, you need to right click on the USBStreamer interface to tick “Use this device for sound output”. It will default the USBStreamer as the default output device for all your media player applications.

9.1.2 Speaker output for default output channel

Being a multichannel device, one can easily configure the USBstreamer for a 7.1 application if I2S is being used to feed a multichannel DAC. Here are the 2 most common configurations.

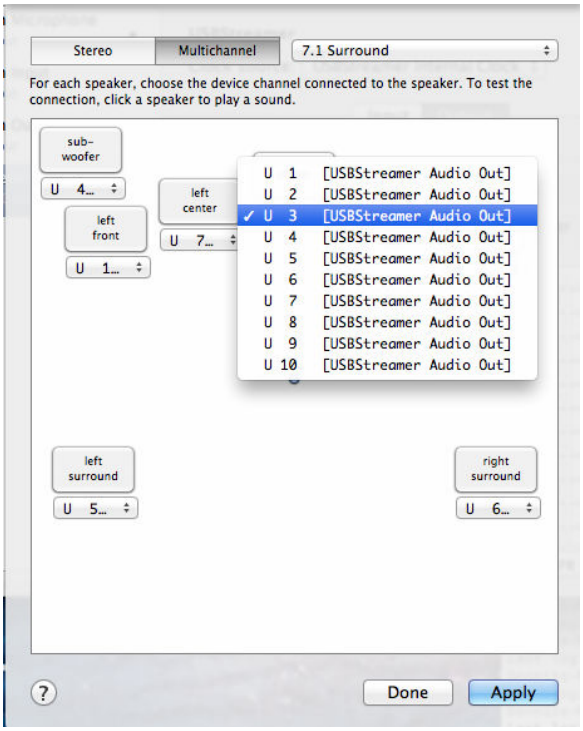
Stereo configuration using the Toslink output to your 3rd party DAC.
Click on Configure Speakers and the below dialog box will appear. Default channels are I2S 1&2. You need to select Ch9&10 (Toslink TX).





7.1 multichannel configuration using the I2S outputs

Similar to before but this time, select the 7.1 Surround configuration from the drop down menu. You then just need to assign the I2S channels as per your DAC configuration.



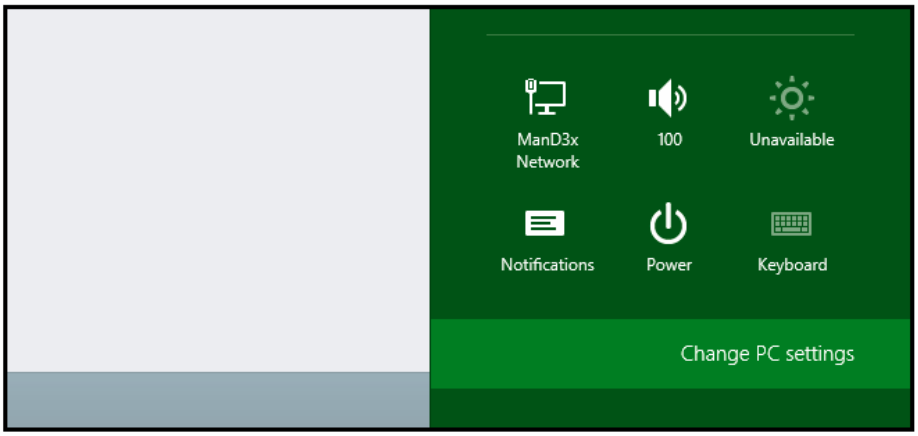
10 Technical specifications

Item	Description
USB Streaming engine	XMOS L2 core USB 2.0 full speed - USB Audio class 2.0 compliant
Capabilities	**PLAYBACK:** Stereo Mode up to 192kHz Multichannel ADAT mode: up to 8 channels at 48/44.1kHz Multichannel I2S mode: up to 8 channels **RECORDING:** Stereo Mode up to 192kHz Multichannel ADAT mode: up to 8 channels at 48/44.1kHz Multichannel I2S mode: up to 8 channels
Drivers	Driverless interface for Mac OS X v10.6.4 and up Thesycon Windows ASIO driver provided
Resolution	24bit support
Sample rate	Supported sample rate: 44.1/48/88.2/96/176.4/ 192kHz
Toslink input	Optical receiver / 26Mbps
Toslink output	Optical transmitter / 26Mbps
Enclosure	Aluminum, sand blasted, anodyzed
Power supply	USB powered
Dimensions (H x W x D) mm	13 x 40 x 62 mm

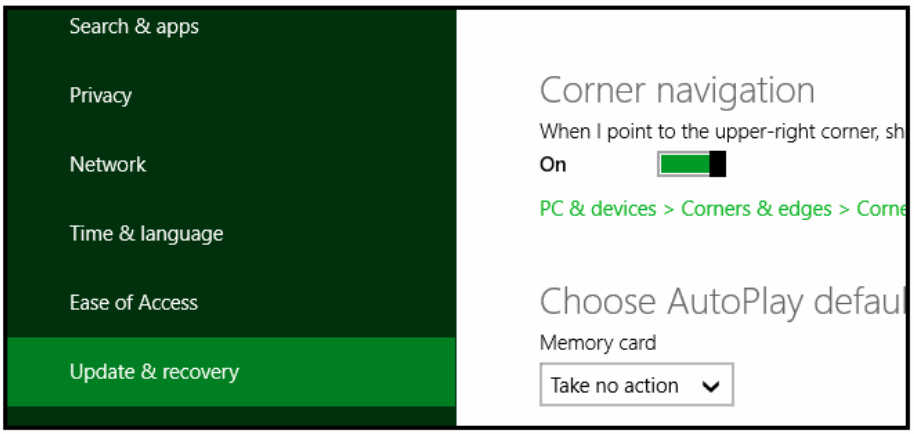
11 Appendix: How to disable driver signing in Win8

Press the Win + C keyboard combination to bring up the Charms Bar. Click on the setting button

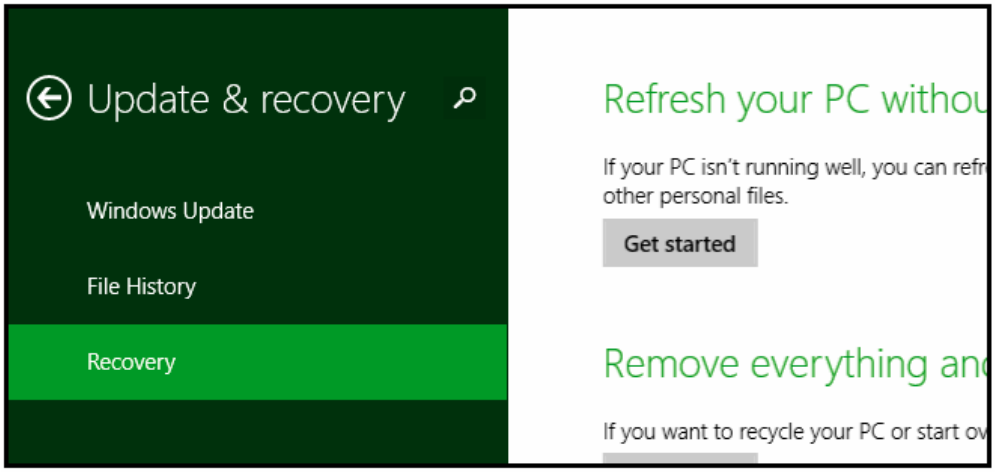
Click on the “Change PC settings”



Click on the update & recovery at bottom left



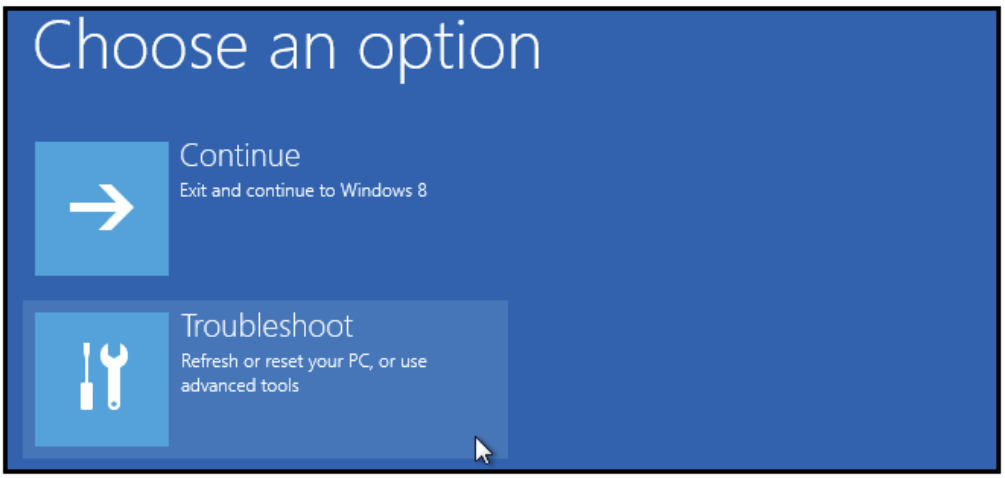
Click on recovery on left side.



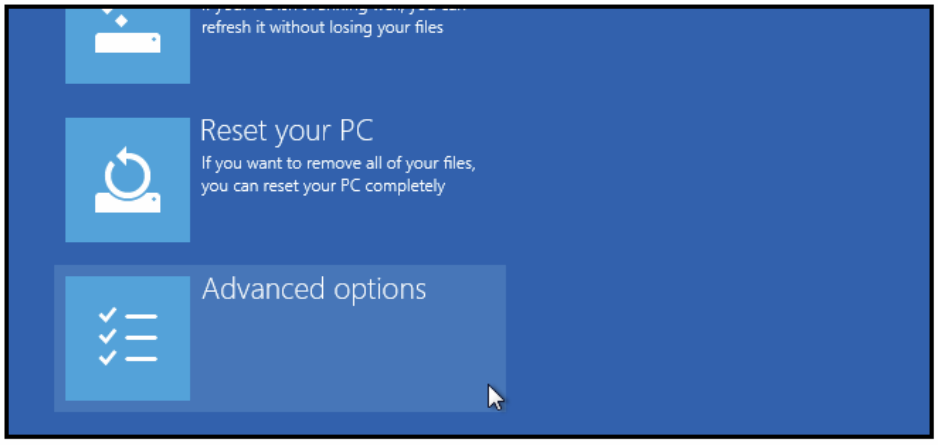
Click on the Restard now (no need to insert any DVD/usb)

Advanced startup
Start up from a device or disc (such as a USB drive or DVD), change Windows startup settings, or restore Windows from a system image. This will restart your PC.
Restart now

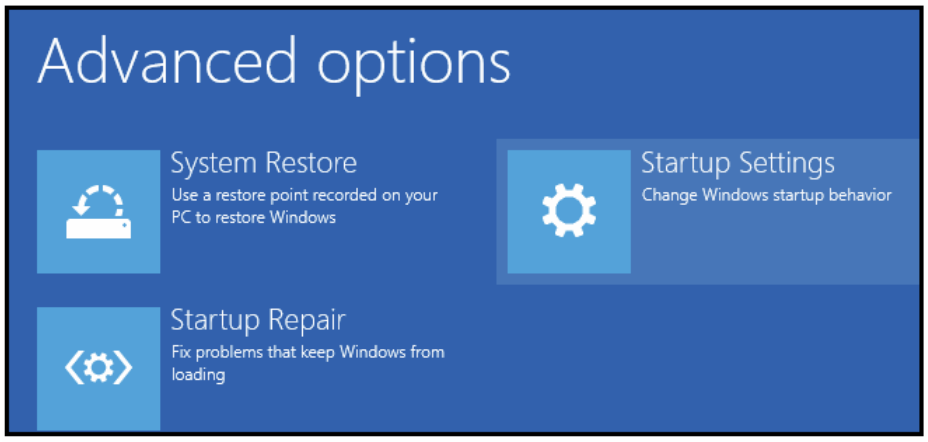
Choose the troubleshoot option once the PC rebooted



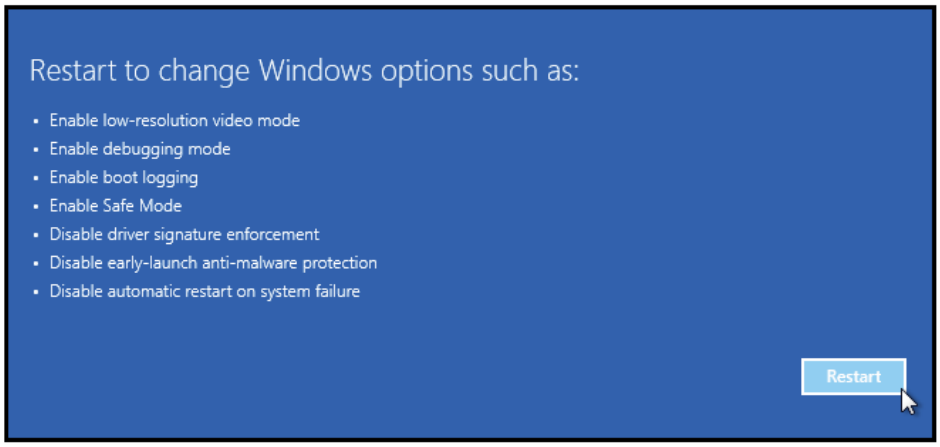
Click on the Advanced options


refresh it without losing your files
Reset your PC
If you want to remove all of your files, you can reset your PC completely
Advanced options

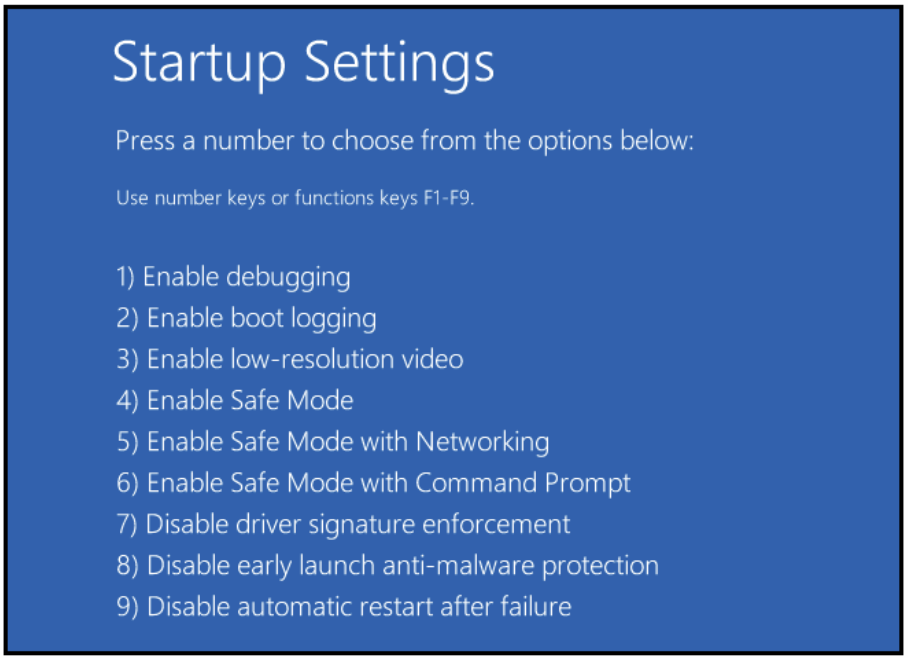
Click on the startup settings


Advanced options
System Restore
Use a restore point recorded on your PC to restore Windows
Startup Settings
Change Windows startup behavior
Startup Repair
Fix problems that keep Windows from loading

One last restart required to allow disabling driver signature enforcement



Finally, you'll be able to change the settings by pressing the F7 key.


Startup Settings
Press a number to choose from the options below:
Use number keys or functions keys F1-F9.
1) Enable debugging
2) Enable boot logging
3) Enable low-resolution video
4) Enable Safe Mode
5) Enable Safe Mode with Networking
6) Enable Safe Mode with Command Prompt
7) Disable driver signature enforcement
8) Disable early launch anti-malware protection
9) Disable automatic restart after failure

Your Win8 PC will now be able to install drivers without signature.